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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,606	03/15/2004	Stanislaus A. Knez	030735/KEL105A	2605
32583	7590	10/04/2004	EXAMINER	
KELLOGG BROWN & ROOT, INC. 601 JEFFERSON AVENUE HOUSTON, TX 77002			PATEL, VINI H	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/708,606	KNEZ ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Vinit H. Patel	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 14-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-21 are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>15 March 2004</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-13, drawn to a process for preparing syngas, classified in class 252, subclass 376.
- II. Claim 14, drawn to an apparatus for producing syngas, classified in class 48, subclass 197R.
- III. Claims 15-21, drawn to drawn to a method of retrofitting a syngas process, classified in class 422, subclass 201.

Invention I is a process directed to a method of making a syngas. Invention II is an apparatus for producing a syngas. Invention 3 is a method of retrofitting a syngas process. The inventions of I, II and III are a process, apparatus and method, respectively, that may be used separately. In this case, the invention I is particular process for preparing a syngas, however the invention of II may be used as an apparatus for making a syngas or for other reformation processes of hydrocarbonaceous fuels. Invention III is a method that may be used for a syngas or other reformation processes of hydrocarbonaceous fuels.

Because the inventions are distinct for the reasons above and have acquired separate status in the art as shown by their different classification and the search required for Group I is not required for Group II and/or III, restriction for examination purposes as indicated is proper.

During a telephone conversation with Daniel Lundeen, Esq. on September 21, 2004, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-13. Affirmation of this election must be made by applicant in replying to this Office action. Group II claim 14 and Group III claims 15-21 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 1, 5-7 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by LeBlanc, U.S. Patent No. 5,122,299.

Regarding claim 1, LeBlanc discloses a method for producing synthesis gases for use in the production of ammonia and methanol from a fresh hydrocarbon component stream which consists of: a) forming a first mixed feed stream comprising steam, a major portion of the fresh hydrocarbon component stream, and an oxidant selected from the group consisting of air, oxygen-enriched air and oxygen and introducing the first mixed feed stream to an exothermic catalytic steam reforming zone wherein there is produced a first reformed gas containing less than 2.0 volume percent, dry basis, residual hydrocarbon and withdrawing the first reformed gas therefrom;

b) forming a second mixed stream comprising a remaining minor portion of the fresh hydrocarbon component stream and steam and introducing the second mixed feed stream to an endothermic catalytic steam reforming zone wherein there is produced a second reformed gas containing less than 10.0 volume percent, dry basis, residual hydrocarbon and withdrawing the second reformed gas therefrom; c) combining the first and second reformed gases and cooling the combined first and second reformed gases by passing the combined gases in indirect heat exchange with the second mixed feed stream within the endothermic catalytic steam reforming zone whereby all of the heat required for the endothermic catalytic steam reforming of the second feed stream therein is provided; and d) withdrawing and recovering the resulting cooled combined gases as synthesis gas product (See Col. 3, lines 5-45 and 53-58; Col. 4, lines 1-10 and Claim 1).

LeBlanc further discloses that the autothermal steam reforming conditions are selected to produce a first reformed gas at a temperature preferably between 900°C and 1100°C (See Col. 3, lines 36-40), thus demonstrating that the first reformed gas effluent would have a cooled temperature within the range from 650°C and 1000°C after the first gas formation.

Regarding claim 5, LeBlanc further discloses the first and second reformed gases are cooled by indirect heat exchange (See Col. 4, lines 13-15).

Regarding claim 6, LeBlanc that the endothermic catalytic steam reforming zone is heated through the catalyst tube walls by the first reformed gas (See Col. 3, lines 46-

50) where the remaining fresh hydrocarbon stream is introduced into the reforming zone to produce a second reformed gas (See Col. 3, lines 53-58).

Regarding claim 7, LeBlanc further discloses a catalyst zone having catalyst-filled bayonet tubes (See Col 3, lines 50-53).

Regarding claims 11-13, LeBlanc further discloses preferably from 55 to 85 percent of a fresh hydrocarbon stream is introduced to the reforming zone (the first mixed stream) (See Col. 2, lines 67-68; Col. 3, lines 1-4) and the remaining portion of the stream is introduced into the reforming zone (the second mixed stream) (See Col. 3, lines 53-55) and therefore is supplied in a preferred ratio of between 55:45 and 85:15 which is within the ranges of 40:60 to 95:5, 40:60-60:40 and 95:5-80:20 as claimed in claims 11-13.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeBlanc, U.S. Patent No. 5,122,299 as applied to claim 1 above, and further in view of Henningsen, U.S. Patent No. 6,005,011.

Regarding claim 2, Leblanc discloses all of the limitations as set forth above in paragraph 1, but does not disclose water introduced into the first reactor effluent as a quench fluid. Henningsen teaches a process wherein a cooling step can be effected by

contacting the associated gas with saturated water, e.g. at about 450.degree. F., to quench the syngas to the saturation temperature of the water, and contacting the quenched syngas with relatively cold water to cool the syngas below the water dew-point to separate and recover the water from the syngas (See Col. 2, lines 15-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify LeBlanc to include the cooling/quenching step of Henningsen for the purpose to reduce the temperature of the syngas stream after the partial oxidation reaction (See Col. 2, lines 53-55).

Regarding claim 3, Henningsen further discloses cooling to supply the cold water can be provided by indirect heat exchange with sea water. Water for the contacting steps can be from a common reservoir which collects water from the quenching and cooling steps (See Col. 2, lines 20-24). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify LeBlanc to include the cooling/quenching step of Henningsen for the purpose to reduce the temperature of the syngas stream after the partial oxidation reaction (See Col. 2, lines 53-55).

Regarding claim 4, LeBlanc further discloses that the endothermic catalytic steam reforming zone is heated through the catalyst tube walls by the first reformed gas (See Col. 3, lines 46-50) where the remaining fresh hydrocarbon stream is introduced into the reforming zone to produce a second reformed gas (See Col. 3, lines 53-58).

3. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeBlanc, U.S. Patent No. 5,122,299 as applied to claims 1 and 5 above, and further in view of Cizmer et al., U.S. Patent No. 5,362,454.

Regarding claim 8, LeBlanc discloses all the limitations as set forth above in paragraph 1, but does not disclose a portion of the second hydrocarbon is supplied to a tube side of the reforming exchanger and passed through the catalyst tubes. Cizmer et al., discloses a catalytic reactor wherein the tubes in the heat exchanger are adapted to hold catalyst therein and allow passage of reactant fluid there-through (See Col. 2, lines 20-24) where in operation, a relatively cool reactant feed fluid (See Col. 3, lines 13) enters the tube-side chamber 40, flows through the tube bundle 20. It would have be obvious to one of ordinary skill in the art to modify LeBlanc to utilize the reactor disclosed in Cizmer et al., for the purpose to support the catalytic reforming of hydrocarbons (See Col. 2, lines 23-24 of Cizmer et al.) process.

Regarding claim 9, LeBlanc discloses all the limitations as set forth above in paragraph 1, but does not disclose the cooled effluent supplied to a shell inlet of a reforming exchanger. Cizmer et al., discloses in operation, a relatively cool reactant feed fluid (See Col. 3, lines 13) enters the tube-side chamber 40, flows through the tube bundle 20 and mixes with the heating fluid in the shell-side chamber 42 (See Col. 3, lines 37-39). It would have be obvious to one of ordinary skill in the art to modify LeBlanc to utilize the reactor disclosed in Cizmer et al., for the purpose to support the catalytic reforming of hydrocarbons (See Col. 2, lines 23-24 of Cizmer et al.) process.

Regarding claim 10, LeBlanc discloses all the limitations as set forth above in paragraph 1, but does not disclose the shell side inlet adjacent an outlet end of the catalyst tubes. Cizmer et al., discloses a shell side inlet 32 adjacent to the outlet end of catalyst tube bundles 20 (See Fig. 1; Col. 3, lines 16-23). It would have be obvious to



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one of ordinary skill in the art to modify LeBlanc to utilize the reactor disclosed in Cizmer et al., for the purpose to support the catalytic reforming of hydrocarbons (See Col. 2, lines 23-24 of Cizmer et al.) process.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinit H. Patel whose telephone number is (571) 272-2071. The examiner can normally be reached on 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VHP

Vinit H. Patel  
September 29, 2004

Alexa Doroshenko

Alexa Doroshenko  
Patent Examiner  
Art Unit 1764